DIGITAL IMAGING SYSTEM

BACKGROUND OF THE INVENTION

5   The present invention relates to a digital imaging system.

Digital images are obtained from a variety of sources, such as from an image scanning system, a digital camera, and a camcorder (digital and/or film). The resulting digital images are used for numerous purposes, such as for example, digital video, web based images, and photographic quality prints.

10   The digital images are typically stored on a write once storage medium or re-writeable storage medium, such as a computer hard drive, a tape, a compact disk, a digital video disk, an optical disk, etc. In addition, multiple images may be stored on the storage medium, thereby creating an archive.

To modify the digital images, the digital images are loaded into the

15   memory of a computer system and thereafter modified using appropriate digital image editing software, such as Photoshop available from Adobe or EditStudio available from Pure Motion, Ltd. After modification of the digital images, the modified digital images are typically stored on a storage medium.

To view the digital images, the digital images are loaded into the

20   memory of a computer system or other type of viewer. Similarly, a browser or other imaging system may be used to search for and view a single image or multiple images.

5   The viewed images may overwrite the existing image file on the storage medium after

viewing.

Further, digital image management software may be used to keep track of

different images, such as where a digital image is stored, who has revised the digital

image, the type of available digital images, etc.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of un-compressing and re-compressing a lossy

JPEG image.

FIG. 2 is a block diagram of un-compressing a lossy JPEG image and -

15   recompressing a lossy GIF image.

FIG. 3 is a block diagram of modifying an image file for viewing.

FIG. 4 is a block diagram of modifying an image file for different

applications, such as storage, editing, or viewing.

FIG. 5 is an exemplary block diagram of a digital image and video

20   content management system of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present inventor came to the striking realization that after extended

viewing, storing, and editing digital images the image quality became increasing more

25   degraded. After further consideration of the unexpected image quality derogation the

5   present inventor determined that the principal source of the image quality derogation is

the modification of the image file itself between different applications.

Referring to FIG. 1, for example, if a digital image file is compressed in

a lossy JPEG format, uncompressed and possibly modified, and recompressed in a lossy

JPEG format, then the resulting image quality will be degraded by the un-compression

10   and re-compression of the lossy JPEG format image file.

Referring to FIG. 2, for example, further if a digital image file is

compressed in a lossy JPEG format, uncompressed and possibly modified, and

recompressed in a lossy GIF format, then the resulting image quality will be degraded

by the un-compression and re-compression of the lossy JPEG and GIF format image

15   files.

Referring to FIG. 3, for example, also if the image is viewed by a image

viewing device the image file is normally modified for optimal viewing for the

particular image viewing device. Thereafter, if the modified image file is subsequently

used for further image processing or otherwise used for other applications, the resulting

20   image quality will be degraded because of the previous optimization for viewing.

Referring to FIG. 4, for example, if the image is captured or otherwise

obtained in an initial format and thereafter modified to a different format for storage,

modified for viewing, modified for editing, or otherwise modified, then the

modifications will result in a derogation of the quality of the digital image.

25   Referring to FIG. 5, an exemplary image processing system includes a

browser 10, editing software 20, managing software 30, capturing device 40, an archive

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5   50, and a viewing system 60. The capturing device 40 may be any suitable device for

obtaining a digital image or digital video. The digital image or video may originate

from a variety of sources, such as for example, from an image scanning system, a digital

camera, and a camcorder (digital and/or film). Also, the capturing device 40 may be a

stream of video, such as video from a computer hard drive or other source. Further the

10   capturing device 40 include a twain or other interface to provide a digital image or

video. The capturing device 40 obtains or otherwise provides a digital image or video

in a particular file format.

The managing software 30 receives or otherwise keeps track of each of

the digital images and video content. The tracking may include tracking copies of the

15   digital images and video content stored in memory, saved in one or more files, or

otherwise used by other parts of the system. The managing software 30 may likewise

include a rendering engine 70, described later.

The digital images and video content may be stored in an archive 50.

The archive 50 typically includes devices for storing the digital images and video

20   content on a write once medium or re-writeable storage medium, such as a computer

hard drive, a tape, a compact disk, a digital video disk, an optical disk, etc. In addition,

multiple images and video content may be archived on the storage medium, thereby

creating an archive. The managing software 30 may include a database indexing all of

the digital images and video content, if desired. The database may likewise include any

25   data for the rendering engine 70. The managing software 30 may store and retrieve

digital images and video content from the archive 50.

5   The viewing system 60 may load or otherwise present digital images and

video content for a user. The viewing system 60 may receive the digital images or video

content from any part of the system, such as for example, the archive 50, the editing

system 20, and the managing software 30. The images or video stored in the archive 50

may be modified by the viewing system 60 for optimized viewing, if desired. However,

10   the viewing system 60 is preferably free from modifying the original image obtained by

the viewing system 60 from the archive 50. Similarly, the image or video obtained by

the viewing system 60 from the managing software 30 is preferably free from modifying

the original image stored in the archive 50. Likewise, the image or video obtained by

the viewing system 60 from the editing software 20 is preferably free from modifying

15   the original image stored in the archive 50. In this manner, any modifications of the

digital image or video content that may be desirable for viewing the media, are free

from modifying the original image after viewing.

         The browser 10 may search, load, or otherwise present digital images and

video content for a user. The browser 10 may receive the digital images or video

20   content from any part of the system, such as for example, the archive 50, the editing

system 20, and the managing software 30. The images or video stored in the archive 50

may be modified by the browser 10 for optimized viewing, if desired. However, the

browser 10 is preferably free from modifying the original image obtained by the browser

10 from the archive 50. Similarly, the image or video obtained by the browser 10 from

25   the managing software 30 is preferably free from modifying the original image stored in

the archive 50. Likewise, the image or video obtained by the browser 10 from the

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5   editing software 20 is preferably free from modifying the original image stored in the

archive 50. In this manner, any modifications of the digital image or video content that

may be desirable for viewing the media, are free from modifying the original image after

viewing.

Traditional editing software is based upon obtaining an image or video

10   from the archive (or other location), modifying the image as desired, and thereafter

saving the modified image over the previous image. In this manner, the modified image

or video replaces the original image or video. However, with the desirability of

maintaining the image or video quality, the editing software 20 is free from modifying

the content of the original image or video, such as the one stored in the archive 50, and

15   creates a list of meta data representative of the changes to be applied to the image or

video. The meta data may be any type of commands, data, or other information suitable

to modify the original image. For example, the rendering engine 70 may be designed to

process the meta data to render the image for other parts of the system, such as the

viewing system 60 and browser 10. The meta data may be stored together with the

20   image or video itself, a separate accompanying file, or otherwise stored in a database,

such as by the managing software 30. The rendering engine 70 may likewise render an

original image from the archive 50 prior to providing the image to the viewing system

60 or browser 10. In this manner, the viewing system 60 and browser 10 does not need

to be modified or otherwise changed to accommodate the meta data.

25   Preferably the entire system is designed such that original images, such

as those obtained from the capturing device 40 or stored in the archive 50, are not

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5   modified, but rather any desired changes to those original images are stored as meta

data. In this manner the image and video quality may be maintained.

If a digital imaging system, including those described above and

traditional ones that do not include meta data or otherwise maintain file integrity, is used

to automatically maintain a list of the user's favorite digital images or video content,

10   there exist limitations with the addition and deletion of the files from the favorites list.

For example, the system may use any suitable algorithm to maintain a list of the user's

most likely favorite digital images and video content. The algorithm may automatically

update the list with new images and video content while simultaneously deleting older,

apparently undesirable, images and video content. While such systems are useful, they

15   have a limitation in that the system will not actually know, without user intervention,

what content the user actually desires to keep. Further, interrupting the user's work

flow by presenting a dialog box that must be answered yes/no each time a file is added

or deleted becomes irritating to the user.

Referring to FIG. 6, to overcome the limitations associated with existing

20   digital image and video content management system for those images most likely

favorites of the user, the present inventor determined that the system should be free

from altering the contents of the favorites without user intervention. Further, the system

should determine, based on any suitable algorithm, when a digital image or video

content may be suitable for or otherwise removed from the favorites entry folder. If an

25   image or video content may be suitable, the present inventor determined that the

intervention required by the user to add or delete should be free from interrupting the

5   user's work flow. The intervention may take the form of a different colored icon

presented to the user, which if pressed adds or deletes an image or video content from

the favorites list. After the time has passed to add or remove a particular image or video

content from the favorites list, the icon may resume its normal color. Further, the user

may be notified by audible indications, such as a particular tone.

10   The terms and expressions employed in the foregoing specification are

used therein as terms of description and not of limitation, and there is no intention in the

use of such terms and expressions of excluding equivalents of the features shown and

described or portions thereof, it being recognized that the scope of the present invention

is defined and limited only by the claims that follow.

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